Title: Investigation of structural effects and behaviour of Pseudomonas aeruginosa amidase encapsulated in reversed micelles

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Abstract: The acetohydroxamic acid synthesis reaction was studied using whole cells, cell-free extract and purified amidase from the strains of Pseudomonas aeruginosa L10 and A13 entrapped in a reverse micelles system composed of cationic surfactant tetradecyltrimethyl ammonium bromide. The specific activity of amidase, yield of synthesis and storage stability were determined for the reversed micellar system as well as for free amidase in conventional buffer medium. The results have revealed that amidase solutions in the reverse micelles system exhibited a substantial increase in specific activity, yield of synthesis and storage stability. In fact, whole cells from P. aeruginosa L10 and AI3 in reverse micellar medium revealed an increase in specific activity of 9.3- and 13.9-fold, respectively, relatively to the buffer medium. Yields of approximately 92% and 66% of acetohydroxamic acid synthesis were obtained for encapsulated cell free extract from P. aeruginosa L10 and A13, respectively. On the other hand, the half-life values obtained for the amidase solutions encapsulated in reverse micelles were overall higher than that obtained for the free amidase solution in buffer medium. Half-life values obtained for encapsulated purified amidase from P. aeruginosa strain L10 and encapsulated cell-free extract from P. aeruginosa strain AI3 were of 17.0 and 26.0 days, respectively. As far as the different sources biocatalyst are concerned, the data presented in this work has revealed that the best results, in both storage stability and biocatalytic efficiency, were obtained when encapsulated cell-free extract from P. aeruginosa strain AI3 at 14/0 of 10 were used. Conformational changes occurring upon encapsulation of both strains enzymes in reverse micelles of TAB in heptane/octanol were additionally identified by FTIR spectroscopy which clarified the biocatalysts performances.

Author Keywords: Reversed Micelles; Pseudomonas Aeruginosa Amidases; Acetohydroxamic Acid; Water Content; Stability

KeyWords Plus: Transform Infrared-Spectroscopy; Hydroxamic Acids; Recombinant Amidade; Enzymatic-Activity; System; FTIR; Purification; Statiblity; Peptides; Proteins

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